United States
Environmental Protection
Agency

EPA530-R-07-001
April 2007

National Priority Chemicals Trends Report (2000-2004)

Section 4
Chemical Specific Trends Analyses for Priority Chemicals (2000−2004): 1,2,4 – Trichlorobenzene (1,2,4−TCB)

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1,2,4 – Trichlorobenzene (1,2,4−TCB)

Chemical Information:

CAS Number − 120−82−1

Alternate Names − 1,2,4−trichlorobenzol

General Uses − This chemical is used as an intermediate or building block to make herbicides. It is also used as a solvent and dielectric fluid, degreaser, and lubricant.

Potential Hazards − This chemical is toxic; inhalation, ingestion, or skin contact can cause severe injury or death. It is also combustible.

Summary Analysis:

- NATIONAL − In 2004, 17 facilities reported approximately 1.9 million pounds of 1,2,4 − TCB. Approximately 93 percent of this quantity was incinerated. Since 2000, treatment (incineration) has been this chemical's primary management method.
- REGIONAL − Five of the 17 facilities that reported this chemical in 2004 were located in Region 6. Region 6 facilities reported approximately 87 percent of the total quantity reported in 2004.
- STATE – Facilities in 13 states reported this PC in 2004; including facilities in five states that accounted for 99 percent of the total quantity in 2004.
- FACILITIES − One Louisiana facility reported approximately 80 percent of the total national quantity, and it also accounted for most of the increase of approximately 200,000 pounds in 2004.
- MANAGEMENT − Treatment (incineration) has been the primary method used to manage 1,2,4−TCB, including approximately 93 percent of 1,2,4−TCB in 2004. Recycling of 1,2,4–TCB has significantly decreased since 2000, from 1.2 million pounds to approximately 38,000 pounds.
- INDUSTRY SECTORS − In 2004, facilities in 10 SICs reported this chemical, including one facility (SIC 2812−Alkalies and chlorine) reporting nearly 80 percent of the total quantity. SIC 2812 facilities also reported the largest quantities of 1,2,4−TCB from 2001−2004.

National Trends:

In 2004, 17 facilities reported approximately 1.9 million pounds of 1,2,4−TCB. Although the number of reporting facilities has remained relatively constant from 2000−2004, significant increases and decreases in the quantity of 1,2,4−TCB occurred in this timeframe. In 2001, the quantity increased by approximately 80 percent, but then decreased by approximately 30 percent in 2002 and again increased, by an average 11 percent, in both 2003 and 2004. Since 2000, treatment (incineration) has been the primary method used to manage 1,2,4−TCB, including approximately 93 percent of 1,2,4−TCB in 2004 (Exhibit 4.1).

Exhibit 4.1. National Management Methods for 1,2,4 – Trichlorobenzene, 2000−2004

Management Method for 1,2,4−TCB Number of Facilities	2000	2001	2002	2003	2004	Percent Change (2000−2004)	Management Method – Percent of Total Quantity of This PC (2004)
Number of Facilities	19	18	17	18	17	−10.5%	-
Disposal Quantity (pounds)	6,602	5,299	7,216	17,138	6,573	−0.4%	0.3%
Energy Recovery Quantity (pounds)	512,794	448,305	118,074	136,029	131,669	−74.3%	7.0%
Total Treatment Quantity (pounds)	669,681	1,691,092	1,401,739	1,521,634	1,750,443	161.4%	92.7%
Total PC Quantity Pounds)	1,189,077	2,144,696	1,527,029	1,674,802	1,888,685	58.8%	-
Total Recycled (pounds)*	1,219,197	78,099	46,190	40,478	38,311	−96.9%	-

*Note: Waste minimization is the emphasis of this Report. As such, we primarily focus on quantities of PCs that are managed via onsite/offsite disposal, treatment, or energy recovery because we believe these PC quantities offer the greatest opportunities for waste minimization. Because recycled quantities of PCs are already directed to their best uses, they are considered separate and distinct from the quantities of PCs not recycled. Throughout this section, the recycled quantity is presented to provide some perspective regarding the quantity of this PC already recycled compared to the quantities that are managed via disposal, treatment, and energy recovery and thus potentially available for waste minimization.

Exhibit 4.2 shows the number of facilities that reported 1,2,4−TCB in 2004 within a range of reported quantities. For example, one facility reported approximately 80 percent of the total national quantity of 1,2,4−TCB in 2004. This same facility also accounted for most of the increase of approximately 200,000 pounds in 2004; this increase is believed to have resulted from a combination of an increase in facility production and quantity of wastes (containing 1,2,4 −TCB) incinerated from offsite sources. At another facility, a smaller but still significant portion of the overall increase of this PC in 2004 was due to an increase in the burning of 1,2,4−TCB as a surrogate in incinerator trial burns.

Exhibit 4.2. Distribution of Quantities by Facilities Reporting 1,2,4–Trichlorobenzene, 2004

1,2,4−TCB (1,888,685 pounds)		
Quantity Reported	Number of Facilities Reporting This Quantity (2004)	Percent of Total Quantity for This PC in 2004
up to 10 pounds	2	less than 0.1%
11 − 100 pounds	0	0.0%
101 − 1,000 pounds	5	0.1%
1,001 − 10,000 pounds	4	0.9%
10,001 − 100,000 pounds	4	13.0%
100,001 − 1 million pounds	1	6.6%
> 1 million pounds	1	79.5%

EPA Regional Trends:

Exhibits 4.3 and 4.4 show the pounds of 1,2,4−TCB facilities reported for each EPA region in 2000−2004. Facilities in Region 6 consistently reported most of the 1,2,4−TCB, including approximately 87 percent of the total quantity reported in 2004. Five of the 17 facilities that reported 1,2,4−TCB in 2004, including the facility that accounted for approximately 80 percent of the total national quantity of this PC, were located in Region 6.

Exhibit 4.3. Quantity of 1,2,4−Trichlorobenzene Reported, by EPA Regions, 2000−2004

EPA Region	2000 (pounds)	2001 (pounds)	2002 (pounds)	2003 (pounds)	2004 (pounds)	Percent of Total Quantity of This PC (2004)
1	0	0	0	0	0	0.0%
2	0	0	0	122	0	0.0%
3	128,562	255,300	3,532	3,776	0	0.0%
4	87,447	59,361	169,125	63,783	60,954	3.2%
5	92,133	100,000	117,731	110,185	60,183	3.2%
6	848,986	1,723,888	1,025,770	1,334,425	1,637,031	86.7%
7	0	0	0	0	245	0.0%
8	0	0	0	0	0	0.0%
9	31,949	6,147	98,044	116,960	6,490	0.3%
10	0	0	112,827	45,552	123,783	6.6%
Total	**1,189,077**	**2,144,696**	**1,527,029**	**1,674,802**	**1,888,685**	**100%**

Exhibit 4.4. Distribution of Facilities Reporting 1,2,4−Trichlorobenzene in 2004 and the Quantities of 1,2,4−Trichlorobenzene Reported in 2004, by EPA Region

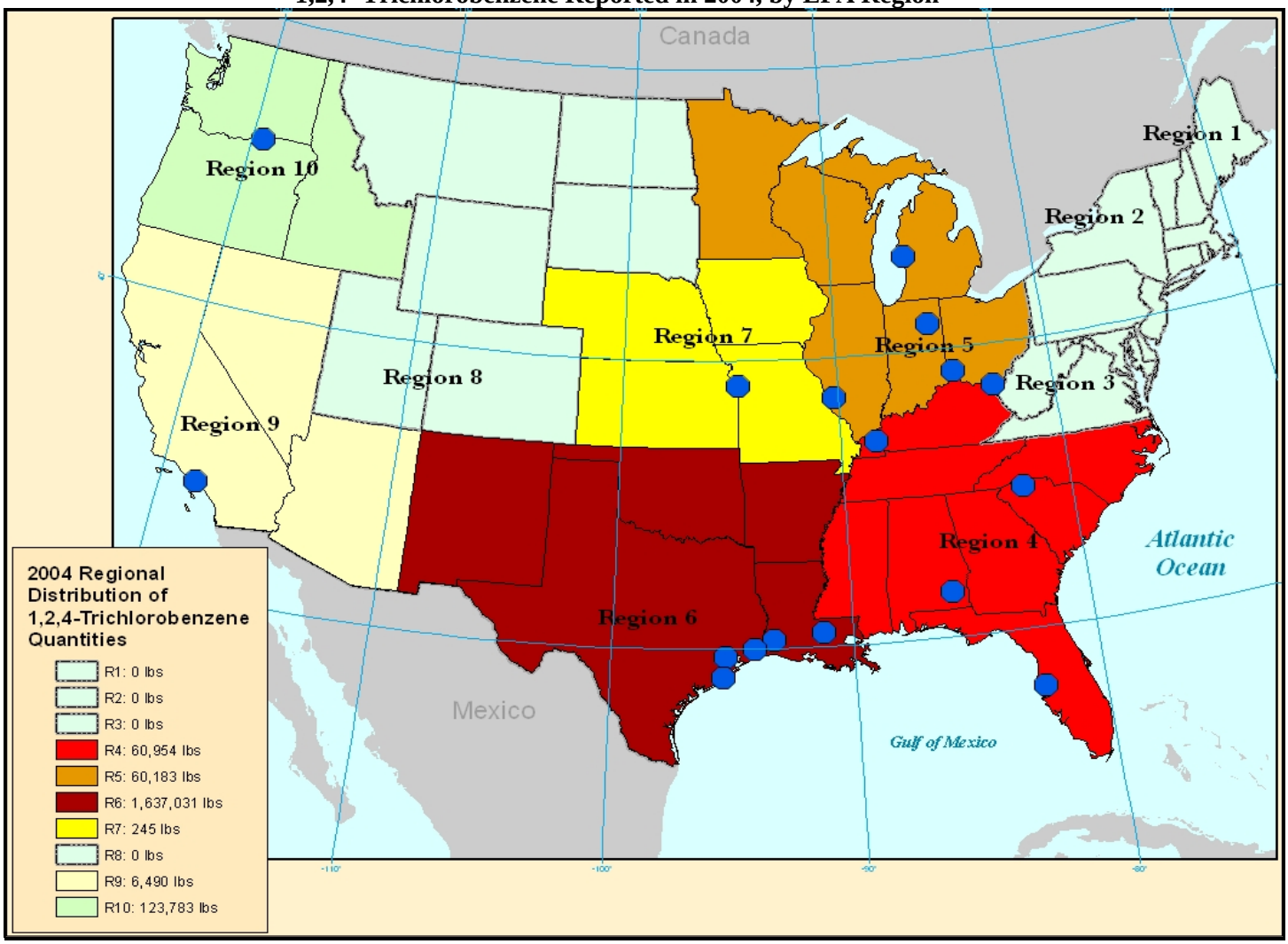


Exhibit 4.5 shows how facilities managed 1,2,4−TCB in 2004, by EPA Region. Most of this PC was treated, primarily by incineration. One facility in Region 4 accounted for 87 percent of the total recycled quantity.

Exhibit 4.5. Regional Management Methods for 1,2,4−Trichlorobenzene, 2004

EPA Region	Quantity of 1,2,4−TCB	Percent of Total Quantity (2004)	Disposal (pounds)		Energy Recovery (pounds)		Treatment (pounds)		Recycling (pounds)	
			Onsite Disposal	Offsite Disposal	Onsite Energy Recovery	Offsite Energy Recovery	Onsite Treatment	Offsite Treatment	Onsite Recycling	Offsite Recycling
4	60,954	3.2%	0	3,200	1,803	163	288	55,500	33,230	0
5	60,183	3.2%	0	5	0	0	0	60,178	0	0
6	1,637,031	86.7%	2,400	968	129,637	66	1,502,953	1,007	0	0
7	245	0.0%	0	0	0	0	242	3	4	0
9	6,490	0.3%	0	0	0	0	6,490	0	0	5,077
10	123,783	6.6%	0	0	0	0	122,434	1,349	0	0
Total	**1,888,685**	**100.0%**	**2,400**	**4,173**	**131,440**	**229**	**1,632,407**	**118,036**	**33,234**	**5,077**

State Trends:

Exhibit 4.6 shows the quantity of 1,2,4−TCB reported by facilities in 21 states, between 2000 and 2004; facilities in only 13 states reported this PC in 2004. Facilities in six of these states accounted for 99 percent of the total quantity of 1,2,4−TCB in 2004. Exhibits 4.7, 4.8, and 4.9 show trends for the quantity of 1,2,4−TCB reported by facilities in each of these states.

One facility in Louisiana reported approximately 80 percent of the total quantity. This same facility has accounted for the majority of the total national quantity of 1,2,4−TCB reported since 2001. The nearly 250,000 pound increase reported in 2004 by this facility likely resulted from a combination of an increase in facility production and quantity of wastes (containing 1,2,4−TCB) incinerated from offsite sources.

Other highlights concerning trends for the reported quantity of 1,2,4−TCB in states include:

- In Oregon, a federal facility accounted for the total quantity of 1,2,4−TCB reported since 2002. This facility burned 1,2,4−TCB as a surrogate in trial burns to ensure its incinerators were properly operating.
- In Texas, the quantity of 1,2,4−TCB facilities reported decreased by approximately 400,000 pounds since 2000, but then increased significantly in 2004. Much of this increase was likely due to offsite wastes incinerated in one facility's industrial furnace.
- In California and Illinois, significant decreases occurred. The facility that reported most of the 1,2,4−TCB in California in both 2002 and 2003 did not report a quantity in 2004. The Illinois facility that has accounted for the total quantity of this PC in Illinois since 2000 was shut down in July 2004.

Exhibit 4.6. State Quantity Trends for 1,2,4–Trichlorobenzene, Based on Largest 2004 Quantity, 2000−2004

State	Quantity (pounds) of 1,2,4−TCB						Percent Change in Quantity (2000−2004)	Percent of Total Quantity of This PC (2004)
	2000	2001	2002	2003	2004	Change in Quantity (2000−2004)		
LA	354,900	1,501,961	994,066	1,300,394	1,546,407	1,191,507	335.73%	81.9%
OR	0	0	112,827	45,552	123,783	123,783	NA	6.6%
TX	492,072	221,394	31,704	34,031	90,624	−401,448	−81.58%	4.8%
KY	43,380	37,746	8,494	62,989	60,139	16,759	38.63%	3.2%
IL	92,133	100,000	114,554	98,139	54,881	−37,252	−40.43%	2.9%
CA	31,949	6,147	98,044	116,960	6,490	−25,459	−79.69%	0.3%
OH	0	0	3,177	12,046	4,905	4,905	NA	0.3%
MI	0	0	0	0	394	394	NA	0.0%
AL	5	5	160,005	6	365	360	7200.00%	0.0%
SC	499	1,705	626	583	287	−212	−42.48%	0.0%
KS	0	0	0	0	245	245	NA	0.0%
FL	0	0	0	205	163	163	NA	0.0%
IN	0	0	0	0	3	3	NA	0.0%
WV	6,026	231,708	0	3,776	0	−6,026	−100.00%	0.0%
NJ	0	0	0	122	0	0	NA	0.0%
PA	1	1	3,532	0	0	−1	−100.00%	0.0%
VA	33,358	23,591	0	0	0	−33,358	−100.00%	0.0%
NC	21,858	19,905	0	0	0	−21,858	−100.00%	0.0%
OK	2,014	533	0	0	0	−2,014	−100.00%	0.0%
DE	89,177	0	0	0	0	−89,177	−100.00%	0.0%
TN	21,705	0	0	0	0	−21,705	−100.00%	0.0%
Totals	**1,189,077**	**2,144,696**	**1,527,029**	**1,674,802**	**1,888,685**	**699,608**	**58.84%**	**100.0%**

Exhibit 4.7. Louisiana and Texas Trends for 1,2,4–Trichlorobenzene, 2000−2004

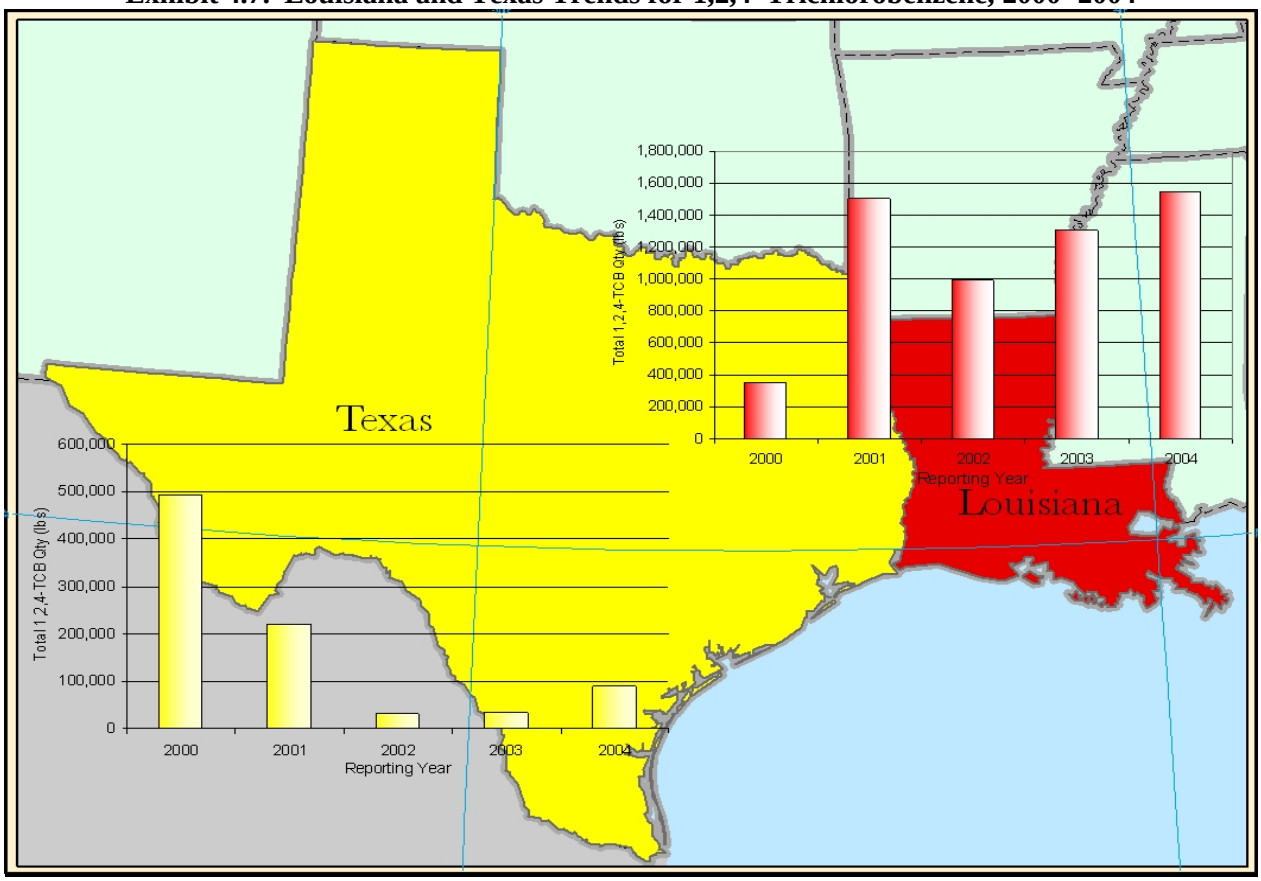


Exhibit 4.8. Oregon and California Trends for 1,2,4 – Trichlorobenzene, 2000−2004

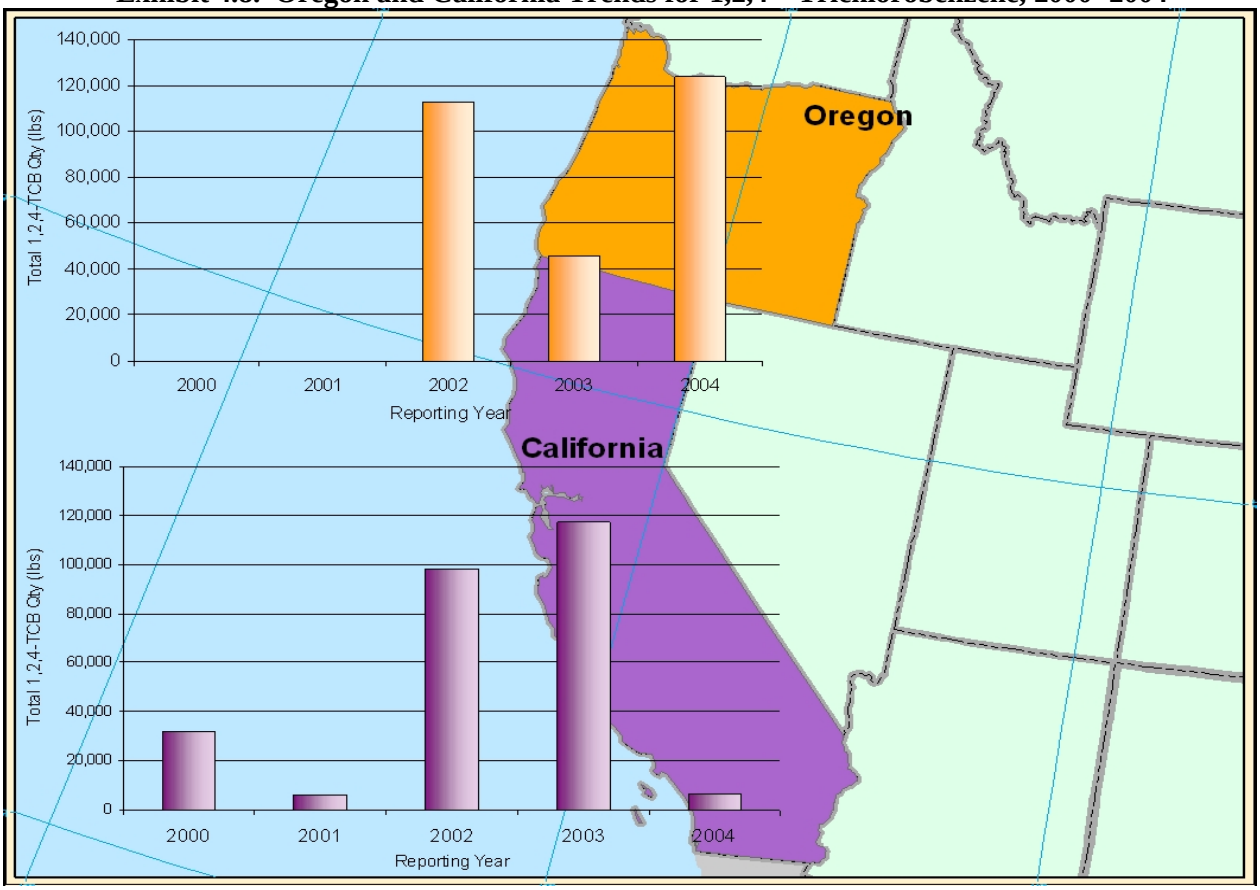
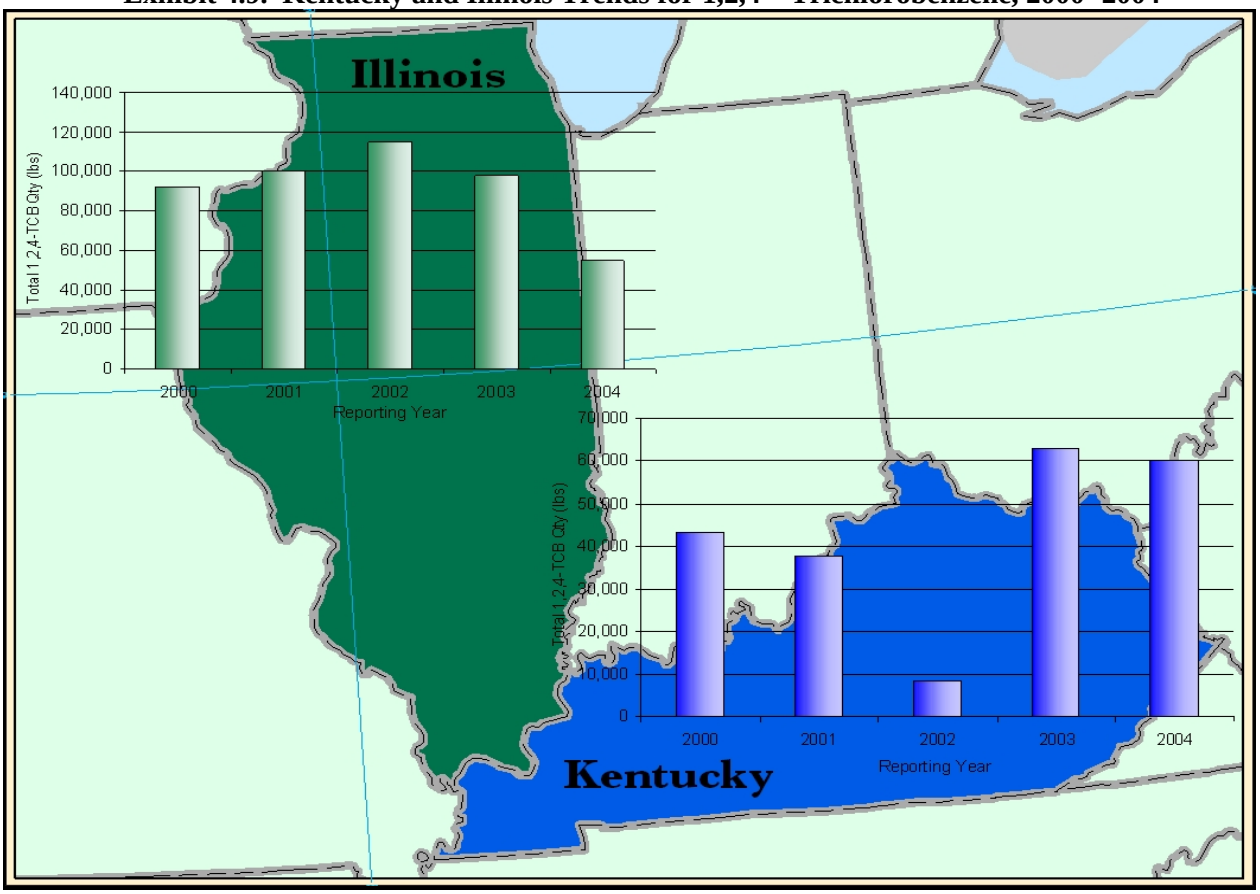


Exhibit 4.9. Kentucky and Illinois Trends for 1,2,4 – Trichlorobenzene, 2000−2004

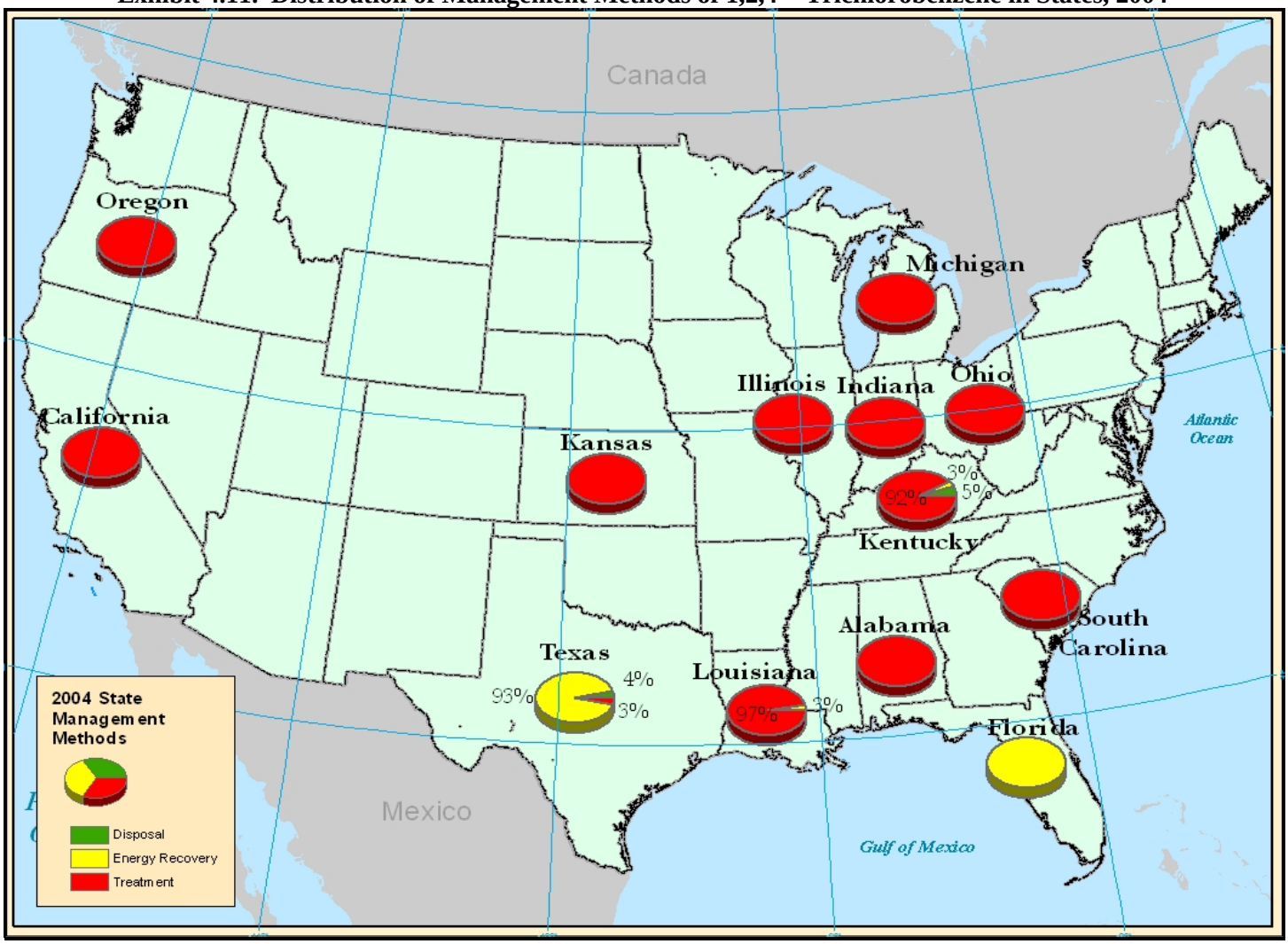


Exhibits 4.10 and 4.11 show how facilities managed 1,2,4−TCB in 2004, by state. Treatment, primarily using onsite incineration, was the primary management method. Facilities also used energy recovery. Overall, only a relatively small quantity of 1,2,4−TCB in 2004 was recycled in 2004. A facility in Alabama accounted for most of the recycling of this PC.

Exhibit 4.10. State Management Methods for 1,2,4−Trichlorobenzene, Based on Largest State Quantity, 2004

State	Quantity	Percent of Total Quantity (2004)	Onsite Disposal (pounds)	Offsite Disposal (pounds)	Onsite Energy Recovery (pounds)	Offsite Energy Recovery (pounds)	Onsite Treatment (pounds)	Offsite Treatment (pounds)	Onsite Recycling (pounds)	Offsite Recycling (pounds)
LA	1,546,407	81.9%	0	18	45,491	66	1,499,825	1,007	0	0
OR	123,783	6.6%	0	0	0	0	122,434	1,349	0	0
TX	90,624	4.8%	2,400	950	84,146	0	3,128	0	0	0
KY	60,139	3.2%	0	3,200	1,803	0	1	55,135	8	0
IL	54,881	2.9%	0	0	0	0	0	54,881	0	0
CA	6,490	0.3%	0	0	0	0	6,490	0	0	5,077
OH	4,905	0.3%	0	5	0	0	0	4,900	0	0
MI	394	0.0%	0	0	0	0	0	394	0	0
AL	365	0.0%	0	0	0	0	0	365	33,222	0
SC	287	0.0%	0	0	0	0	287	0	0	0
KS	245	0.0%	0	0	0	0	242	3	4	0
FL	163	0.0%	0	0	0	163	0	0	0	0
IN	3	0.0%	0	0	0	0	0	3	0	0
Totals	**1,888,685**	**100.0%**	**2,400**	**4,173**	**131,440**	**229**	**1,632,407**	**118,036**	**33,234**	**5,077**

Exhibit 4.11. Distribution of Management Methods of 1,2,4 − Trichlorobenzene in States, 2004



Industry Sector (SIC) Trends:

Exhibit 4.12 shows the quantity of 1,2,4−TCB for each industry sector in which facilities reported this PC in 2000−2004. In 2004, of the 10 industry sectors for which 17 facilities reported 1,2,4–TCB, one facility (SIC 2812–Alkalies and chlorine) reported nearly 80 percent of the total quantity of this PC. SIC 2812 facilities also reported the largest quantities of 1,2,4−TCB from 2001 to 2004.

Exhibit 4.12. Industry Sectors Quantities of 1,2,4−Trichlorobenzene, 2000−2004

Primary SIC	SIC Description	Facilities in This SIC Code (2004)	Quantity (pounds) of 1,2,4−TCB					Change in Quantity (2000−2004)	Percent of Total Quantity of This PC (2004)
			2000	2001	2002	2003	2004		
2812	Alkalies and chlorine	1	360,926	1,733,669	993,819	1,304,170	1,500,850	1,139,924	79.5%
2819	Industrial inorganic chemicals, nec	2	426,566	152,930	26,404	28,631	129,703	−296,863	6.9%
9711	National security	1	0	0	112,827	45,552	123,783	123,783	6.6%
2865	Cyclic crudes and intermediates	3	224,410	137,730	123,848	162,751	119,924	−104,486	6.3%
3679	Electronic components, nec	1	31,336	5,089	10,527	12,230	6,490	−24,846	0.3%
2879	Pesticides and agricultural chemicals, nec	2	2,950	3,100	5,300	5,400	3,744	794	0.2%
2869	Industrial organic chemicals, nec	3	21,990	21	272	13	3,494	−18,496	0.2%
2843	Surface active agents	1	499	1,705	626	583	287	−212	0.0%
5171	Petroleum bulk stations and terminals	2	0	0	0	0	248	248	0.0%
3731	Ship building and repairing	1	0	0	0	205	163	163	0.0%
2231	Broadwoven fabric mills, wool	0	33,358	23,591	0	0	0	−33,358	0.0%
2261	Finishing plants, cotton	0	21,858	19,905	0	0	0	−21,858	0.0%
2493	Reconstituted wood products	0	62,556	61,564	0	0	0	−62,556	0.0%
2851	Paints and allied products	0	1	1	3,532	0	0	−1	0.0%
2899	Chemical preparations, nec	0	613	1,058	2,831	1,951	0	−613	0.0%
2911	Petroleum refining	0	2,014	4,333	0	0	0	−2,014	0.0%
3479	Metal coating and allied services	0	0	0	84,686	102,779	0	0	0.0%
3711	Motor vehicles and car bodies	0	0	0	2,357	9,855	0	0	0.0%
3795	Tanks and tank components	0	0	0	160,000	0	0	0	0.0%
5169	Chemicals and allied products, nec	0	0	0	0	683	0	0	0.0%
Total		**17**	**1,189,077**	**2,144,696**	**1,527,029**	**1,674,802**	**1,888,685**	**699,608**	**100%**

Exhibit 4.13 shows how facilities managed 1,2,4−TCB in the 10 industry sectors for which they reported this PC in 2004. Approximately 86 percent of the 1,2,4−TCB was treated, primarily using onsite incineration. One facility (SIC 2812−Alkalies and chlorine) accounted for most of this treatment quantity. Two facilities (SIC 2819−Industrial inorganic chemicals, nec) primarily used onsite energy recovery for their 1,2,4−TCB. One facility (SIC 2869−Industial organic chemicals, nec) reported most of the recycling of this PC in 2004.

Exhibit 4.13. Management Methods for 1,2,4−Trichlorobenzene in Industry Sectors, 2004

Primary SIC	SIC Description	Quantity of 1,2,4−TCB (2004)	Percent of Total Quantity (2004)	Disposal (pounds)		Energy Recovery (pounds)		Treatment (pounds)		Recycling (pounds)	
				Onsite Disposal	Offsite Disposal	Onsite Energy Recovery	Offsite Energy Recovery	Onsite Treatment	Offsite Treatment	Onsite Recycling	Offsite Recycling
2812	Alkalies and chlorine	1,500,850	79.5%	0	18	0	0	1,499,825	1,007	0	0
2819	Industrial inorganic chemicals, nec	129,703	6.9%	0	0	129,637	66	0	0	0	0
9711	National security	123,783	6.6%	0	0	0	0	122,434	1,349	0	0
2865	Cyclic crudes and intermediates	119,924	6.3%	0	3,205	1,803	0	0	114,916	0	0
3679	Electronic components, nec	6,490	0.3%	0	0	0	0	6,490	0	0	5,077
2879	Pesticides and agricultural chemicals, nec	3,744	0.2%	2,400	950	0	0	0	394	0	0
2869	Industrial organic chemicals, nec	3,494	0.2%	0	0	0	0	3,129	365	33,230	0
2843	Surface active agents	287	0.0%	0	0	0	0	287	0	0	0
5171	Petroleum bulk stations and terminals	248	0.0%	0	0	0	0	242	6	4	0
3731	Ship building and repairing	163	0.0%	0	0	0	163	0	0	0	0
	Totals	**1,888,685**	**100.0%**	**2,400**	**4,173**	**131,440**	**229**	**1,632,407**	**118,036**	**33,234**	**5,077**